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**SUBJECT:** Issue Paper #2 - Fare Structure and Policy

There are three basic elements of fare policies: underlying structure, differentiation within that base structure, and technology/methods for fare collection. The first three sections of this paper examine each of these elements. The final section presents a table of potential changes to the Atlanta regional fare system and the pros and cons to those changes.

#### Fare structure

Underlying each fare policy is a basic defining structure of which there are three main types:

- 1. Flat Everybody pays the same fare regardless of where they board or leave the system. This is basically what currently is used in the Atlanta region with some differentiation of base fare depending upon the service offered;
- 2. Zonal The fare paid is based upon the number of zones the rider travels through during a trip; and
- 3. Distance-Based (has been proposed by some Board members) the fare paid is based upon the distance traveled during a trip

A **flat fare**, which is currently used within the Atlanta region, has one fare throughout the service area. In other words, within a provider's service area, one base rate is charged regardless of the distance actually traveled. Ways this type of fare can be differentiated are presented later. In Atlanta, MARTA and Gwinnett County Transit have a flat fare of \$1.75, *Xpress* has a flat fare of \$3.00, C-TRAN has a flat fare of \$1.50, and CCT has a flat fare of \$1.25.

**Zonal systems** divide the service area into zones. This is quite common in major European cities and is found to a limited extent in some U.S. cities, frequently on commuter rail/commuter routes. Figure 1 shows a map of the Parisian zonal system and Figure 2 shows a map of the Boston Commuter Rail zonal system.

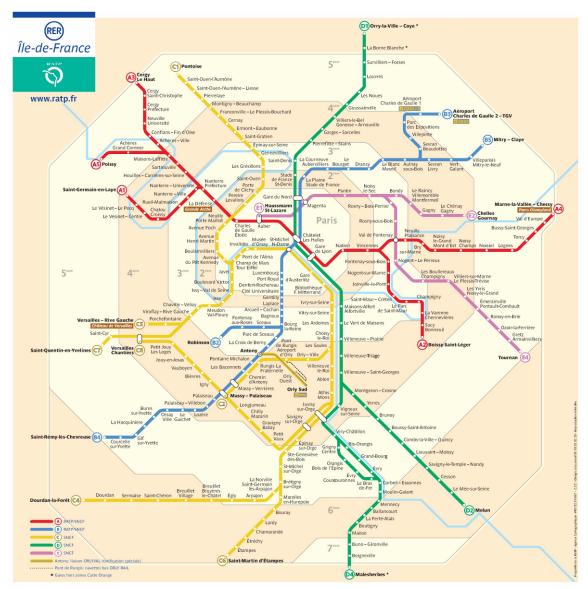


Figure 1 – Map of the Regional Train System in Paris showing Zones

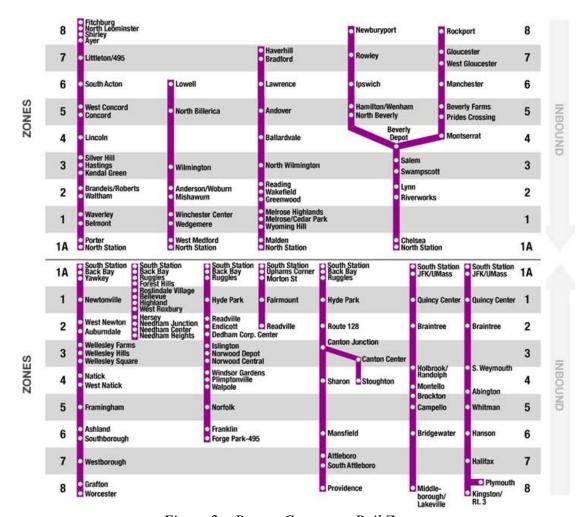


Figure 2 – Boston Commuter Rail Zones

Within each zone, riders pay a flat fare and are charged additional markup based upon the number of zones crossed during a journey. For instance, using the zonal map for Boston, a passenger traveling between Wellesley Square and Wellesley Farms (Worcester Line – first line in the bottom left, zone 3) would pay a flat fare of \$1.70 and then would pay an increasing fare for each additional zone to which they traveled. Frequently the zones extend out concentrically from the central city. However, as Figure 3 shows for the system in Vienna, even if the zones extend out concentrically from the central city, they do not necessarily have a uniform zone within each concentric region.

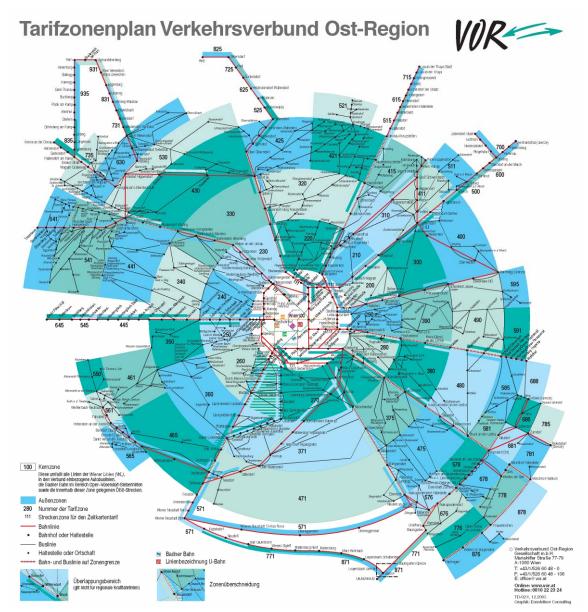


Figure 3 – Zonal System of the Regional around Vienna for Rail and Bus

As illustrated, zonal based systems can range from simple to complex. As an illustration, an initial zonal system within the Atlanta region could originally consist of three zones – a central zone bounded by the railroad cordon (the proposed Beltline loop), a middle zone between the railroad cordon and I-285 and an outer zone encompassing everything outside I-285. Alternatively, the region could have multiple (perhaps 7) zones outside of I-285 roughly corresponding to how the region is divided by freeways with the dividing lines between I-75, I-85, I-20, and GA 400. The technology of how to implement these zones will be discussed in the third section of this paper.

Distance-based fares use a per-mile cost or similar measure to vary the cost based upon the distance traveled. The main technical questions are how to collect fares on buses and how much to charge per mile. Distanced based fares are similar to zonal fares in that the fare charges change proportionally with distance traveled. However, unlike zonal base fares where the number of zones traveled determines the fare, distance based fares charge a flat rate and then a per/mile charge on top of the flat rate. Unlike Zonal Trips where destinations within the same zone have the same fare, each destination has a different fare that is completely reliant upon the distance of the trip. Therefore, under a distance-based fare system, each trip is likely to have a different fare, while under a zonal system, multiple trips of different, but similar distances, will have the same fare.

With the current transit system in Atlanta, a zonal or distance based fare system for MARTA rail and express buses could easily be implemented based upon limited or controlled boarding and alighting points. However, implementing these systems on local buses services will be more of a technical challenge because of need to install fare equipment at the exit of each bus. Some alternatives to overcome this challenge are presented in the third section of this paper.

#### **Differentiation**

Within each of the main fare structures, it is possible to differentiate those fares to encourage or target specific types of patrons or activities. A list of differentiations used by Atlanta's operators and a description of these differentiations is provided below.

<sup>&</sup>lt;sup>1</sup> "Sound Transit seeks public input on proposed changes to Sounder Fare structure" February 17, 2007. <a href="http://www.soundtransit.org/x4823.xml">http://www.soundtransit.org/x4823.xml</a> (Last accessed: March 5, 2007)

Table 1 – Types of Fare Differentiations Used by Regional Operators

Differentiation	MARTA	Xpress	CCT	GCT	C-TRAN
Peak/Off Peak		X – Reverse Commute Rides discounted			
Transfers	X – Agreements with all other systems	X – Agreements with MARTA	X – Agreements with MARTA	X – Agreements with MARTA	X – Agreements with MARTA
Premium Service Surcharge			X – Express bus services to Atlanta	X – Express bus services to Atlanta, Local to Express Upgrade fare	
Multi-Ride Passes	X – 10 and 20 trip tickets	X – 20 and 40 ride passes	X – 10 and 20 ride tickets	X – local and express 10 ride ticket	X – 20 trip ticket
Unlimited Ride Passes	X – 7 day, 30 day, and multi-day visitor passes	X – 31 day passes	X – Local and Express 31 day pass	X – Local and Express monthly pass	X – 31 day pass
Special Fares	X – 65+ half fare and Student (K- 12) and University Pass Programs		X – Reduced fare for 65+ and <18	X – Reduced fare for 65+ and <18	X – half fare for 65+

- Peak/Off Peak This differentiation involves a different fare for peak period and/or peak direction travel. In Washington D.C., peak fares are used to discourage non-discretionary travel during peak commuting periods and to relieve pressure on the central subway systems by charging a higher fare during the peak travel period. In Atlanta, *Xpress* uses offpeak direction discounts (the Reverse Commute Fare) on its reverse commute services to accommodate workers who live in the central city and work in outlying areas as well as make what would otherwise be a deadhead trip back to the Park and Ride location a revenue trip.
- **Transfers** Many agencies, but not all, issue free transfers between services (i.e. a free transfer between bus and rail or between buses). It is usually an effort to increase ridership and simplify the fare system. In the Atlanta region, every agency has free transfers within their respective systems and free transfer at specific locations with a neighboring system.
- Premium Service Surcharge Premium services are services above local services usually geared towards choice riders and longer commutes. These services frequently provide faster or at least more comfortable services (on over the road/commuter coaches with larger, padded seats) and therefore a premium charge is placed on these services. In our region, premium

services that are charged at above the base fare rate on express buses operated by CCT and Gwinnett County. While MARTA's BlueFlyer and *Xpress* offer a premium service through limited stops and more comfortable seats, the BlueFlyer charges the base \$1.75 fare found on the rest of MARTA's system while *Xpress*' base fare of \$3.00 reflects its premium service and is not a surcharge above a lower base fare such as found on Gwinnett or CCT express routes.

- **Multi-Ride Passes** These are bulk trips where the operator provides an incentive for riders to buy trips in bulk rather than paying for trips individually. Usually, these passes are meant to speed up boarding times. They are used in the Atlanta region extensively.
- Unlimited Ride Passes These are time delimited passes that allow for unlimited rides on the system throughout the time period (for example, a one week or monthly pass). They are frequently provided at least in weekly, monthly, and sometimes annual increments and are designed to encourage full use of the system for all trips. Some systems target visitors by providing day or short-term passes, while others target students at local institutions by providing semester-based passes. All operators have at least a monthly pass program in our region.
- **Special Fares** These are special fares or passes targeted at a specific audience. For example, operators who are mandated to provide paratransit services are also required to provide half-fares for individuals 65 and over, Medicare recipients and other disabled individuals. Additionally, there are special program that provide reduced passes and fares targeting secondary school trips (K-12), youths (<18) and University Students. Each of these types of fares is found in the Atlanta region.
- Multi-Agency Tickets This is a ticket that allows travels on two different systems for a higher fare, but at a fare less than a combination fare. For example, if CCT and MARTA did not have a free transfer, a passenger traveling from the Airport to Cumberland Mall (CCT Transfer Center) would pay \$1.75 from the Airport to the MARTA Arts Center Station and then another \$1.25 to travel from Arts Center to Cumberland, paying \$3.00 for the full trip. Instead of having a free transfer, MARTA and CCT could set up an agreement for a joint ticket that costs \$2.25, for example, that is less than \$3.00 full fare, but more than the \$1.75 the two systems share at this time. This would provide an incentive for people to take the trip on transit, thus increasing ridership, but could reduce the revenue from the fares for each trip by a difference of \$0.75. However, the increase in ridership could potentially make up or exceed that fare difference.
- Multi-Agency Passes Similar to multi-agency tickets, these are multiagency passes that allow for unlimited rides on multiple systems that cost more than an individual pass for each system, but less than two separate passes.

These are just some of the ways that fares can be differentiated using the existing base fare structures.

#### Technologies/Collection systems

The type of base fare structure selected has a direct impact on the technologies and systems used in fare collection. The Breeze System will form the technical basis for the foreseeable future in the Atlanta region. However, there are several potential methods, including our existing methods, of collecting these fares.

- **Barrier** This is the method currently used in the rail stations with a barrier gate that requires payment of a fare before entry is allowed. In the future (currently anticipated as the end of June 2007), patrons will also have to tap their Breeze card to exit the station as well. The proposed I-75/575 HOV/BRT project has several stations that would have barrier entry. Barrier entry allows for the easy implementation of distance or zonal based fares on a fixed guideway system since patrons will be required to utilize their fare card when entering and exiting the system.
- **Proof of Payment** or POP systems, are common in cities in northern Europe such as Brussels, Amsterdam, Munich, Cologne, and Vienna. Portland, OR, San Diego and many of the new light-rail systems in the United States also use a POP system. In this system, patrons purchase a ticket from a vending machine or ticket vendor outside the system and then board the vehicle. Patrons may also purchase a ticket on the vehicle from the driver or a machine located in the vehicle. Patrons must then validate their ticket in a machine that time stamps the ticket or tap the ticket on a pad similar to our Breeze system to time stamp the start of their journey. Enforcement of payment of fares is controlled by roving fare inspectors who board vehicles and ensure patrons have paid the fare. In some cities the inspectors board the vehicle; the driver closes the doors while the inspectors are working to prevent patrons who have not paid from exiting the vehicle. Additionally, fines for fare evasion are usually set high (Dallas has a fine of \$75 and Brussels a fine of approximately \$100). Fare inspectors sometimes double as transit security as they do on Los Angeles' Commuter Rail system, Metrolink. This system allows for ease of access to stations by eliminating fare gates. It also allows for easier implementation of distance and zonal based fares on bus and other surface systems by eliminating the need for patrons to have to prove they have paid the correct fare when exiting a vehicle. One disadvantage is patrons become responsible for determining what fare they have to pay. vending machines can get quite complicated, as shown in Figures 4 and 5 - a fare validation machine in Antwerp and an on-board ticket machine in Munich.



Figure 4 – Ticket Validation Machine in Antwerp



Figure 5 – On-Board Ticket Vending Machine

• Pay as You Board – This system is currently in use on buses in this region where patrons show a pass or pay as they board the bus. While this system works well in areas with a flat fare, with a zonal or distance base fare there must be someway to track whether a passenger has crossed a zone or how far they have traveled. Therefore, there must be some mechanism to pay or control as a patron exits. While not used yet in Atlanta, Pay as You Exit will be introduced in Atlanta at rail stations in June, 2007 when patrons will have to tap their Breeze card to exit the rail stations.

It is possible to have two different types of fare systems in operation at the same time. In the Atlanta region, there is one system for the rail system (barrier) and one system for the bus system (pay as you board). In many US cities, such as Dallas and San Diego, there is a POP system for the metro, commuter rail, and trams, while buses are pay as you board.

### **Challenges/Potential Options**

There are several things to remember when considering changes to the region's fare system. First, any change in fare products in the region will incur a cost to reprogramming the existing Breeze Vending Machines and in retraining the frontline operators (bus drivers and ticket vendors) in the new media. Secondly, changes in the fare system will likely impact fare revenues. It is naturally a concern that any changes in fare products have, at a minimum, no reduction in fare revenue actually collected. For instance, switching to a multi-agency ticket could raise the overall fare by eliminating free transfers (with the cost of transfer built into the ticket), thereby reducing some ridership, but since there is a larger fare, the overall fare revenue could be unchanged. Third, the Environmental Justice impacts of a fare or fare system change need to be considered as a condition of receiving any federal transit aid. This primarily concerns the implementation of distance-based fares since many lower income households may be located longer distances from their places of employment.

Table 2 provides some pros and cons of different potential changes to our regional fare system. It is structured to provide an understanding of the complexities involved in changing fare systems and policies. Like any major business decision, substantial preparatory work will be required to make the decision.

Table 2 – Pros and Cons of Potential Changes to the Atlanta Regional Fare System

Change	Pros	Cons
Zonal/Distance Based Fares with Barrier system for rail and BRT and pay as board/exit for buses	<ul> <li>Fares differentiated by distance</li> <li>Fairly easy to implement on the rail system</li> </ul>	<ul> <li>How to deal with buses that cross multiple zones?</li> <li>Cost to retrain drivers</li> <li>Increases in fare disputes</li> <li>Increase in boarding/alighting times</li> <li>Transfers</li> <li>New fare system for patrons</li> <li>Equity issues</li> </ul>
Zonal/Distance Based fares with barrier system for rail and BRT and POP for buses	<ul> <li>Fares differentiated by distance</li> <li>Fairly easy to implement on the rail system</li> <li>Decreased boarding time for buses</li> <li>If security carries out enforcement, increased security presence on system</li> </ul>	<ul> <li>Cost of machines/driver training for fares onboard buses</li> <li>Equity Issues</li> <li>Completely new fare system for patrons</li> <li>Increased cost of enforcement</li> </ul>
Multi-Agency Ticket/Passes	<ul> <li>Single Regional Fare Media</li> <li>Potential to recover more cost based upon fare selected</li> <li>Initial concept of distance based ticket</li> <li>Maintains Existing Operator Independence to set fares within jurisdiction</li> <li>Operators recover more of cost since transfer cost built into ticket price</li> </ul>	Increase patron costs since cost of transfer built into ticket price
Zonal/Distance Based fares with barrier system for rail and BRT with multi-agency ticket/passes for buses	<ul> <li>Single Regional Fare Media</li> <li>Potential to recover more cost based upon fare selected</li> <li>Fares differentiated by distance</li> <li>Operators recover more of cost since transfer cost built into ticket price</li> <li>Maintains Existing Operator Independence to set fares within jurisdiction</li> </ul>	Increase patron costs since cost of transfer built into ticket price     Equity Issues
Complete POP system with zonal /distance based fares	<ul> <li>Reduces boarding times</li> <li>Improves access to overall system by eliminating barriers</li> <li>If fare enforcement carried out by security, increased security visibility on system</li> <li>Allows full implementation of zonal/distance based fares</li> </ul>	<ul> <li>Increased cost of enforcement</li> <li>Completely new fare system and structure for patrons to learn</li> <li>Cost of retraining operators and vendors</li> <li>Cost of ticket validation machines</li> </ul>

### **Appendix A: Policy Foundation of Equity Analysis<sup>2</sup>**

**Title VI of the Civil Rights Act of 1964,** which states, "No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance

**National Environmental Policy Act of 1969,** which decided in favor o community-oriented analysis of policymaking. For proposed major transportation facilities, an analysis of environmental impacts was not required that went beyond the infrastructure itself to include a broader geographic area

**Federal Aid Highway Act of 1970**, which assured that transportation facilities be approved "in the best overall public interest" with efforts to eliminate or minimize effects on community cohesion, employment effects, and displacement of people

**Civil Rights Restoration Act of 1987,** which identified the extent to which Title VI applied, to include all Federal-aid recipients, sub-recipients, and contractors regardless of whether specific activities in question are federally funded or not

Executive Order 12898 of 1994, which established the precedent that environmental justice consideration be extended to low-income and minority populations and to avoid "disproportionately high and adverse" effects.

**U.S. Department of Transportation implementation actions,** which provided requirements upon and guidance for transportation agencies and professionals in incorporating environmental justice principles in all transportation activities

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<sup>&</sup>lt;sup>2</sup> David Ungemah. "This Land is Your Land, This Land is My Land: Addressing Equity and Fairness in Tolling and Pricing," <u>Transportation Research Board 86<sup>th</sup> Annual Meeting Compendium of Papers CD-ROM</u>. January 21-25, 2007. pg. 3.

# Memorandum

# **Appendix B:** Types of Fare Differentiation Used at Various Other Major Operators in the United States

Table 3 – Types of Fare Differentiations Used by Regional Operators

Differentiation	Boston – MBTA	Chicago – CTA	LA - MTA	San Francisco – MUNI	Seattle – King County Metro	Houston - METRO	Washington - WMATA	Dallas - DART	Denver - RTD
Peak/Off Peak			Reduced night bus (9 PM – 5 AM)		Off peak zonal	Peak hour Express Bus	Peak fares on rail system, off-peak weekly pass		
Transfers			\$0.25 transfer to municipal lines	\$0.25 reduction from BART			Transfer Charges to other systems		
Premium Service Surcharge	Express Bus surcharges		Additional fare for Express buses	Special Events, Cable Cars,		Express and P&R surcharges	Higher Express Bus Fares	Express buses require Premium Fare	Airport, Express and regional bus
Multi-Ride Passes	10-ride, 12-ride, 60-ride		10-tokan bag	Youth 15-ride,	10, 16, and 20 ride tickets				10-ride
Unlimited Ride Passes	1-day, 7-day, monthly, and annual	1-day, 7-day, and monthly	Day, weekly, semi-monthly, monthly	Weekly, monthly, 1, 3, and 7-day	Monthly, Annual	1, weekly and monthly	1 and 7 day bus and rail passes	1, monthly, and annual	Daily, Monthly, and annual
Special Fares	Half fare, Students (K- 12), Youth (<11), University	Visitor, Youth (<11 and K-12) University, and half fare	Half-fare, student (K-12), college	Half-fare, youth (<18)	Half-fare, youth (<18)	Youth (<11), Student, half- fare, 70+ lifetime pass for free	Children (<5), half-fare	Half-fare, students, children (<14), college	Half-fare, student (<20), and college
Multi-Agency Tickets			Metrolink (commuter rail) tickets accepted for local travel					Premium Ticket between Dallas and Ft. Worth	
Multi-Agency Passes		Monthly pass also valid on most PACE buses	EZ-transit pass (metro Bus, rail and Orange line)	Adult monthly (BART within SF), Translink (Pilot)	1, 3, and 12 month regional passes (Puget Pass),			Monthly Premium Pass for travel in Dallas and Ft. Worth	